IN THE

Supreme Court of the United States

STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and STATE OF PENNSYLVANIA, *Complainants,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, *Defendants,* STATE OF MISSOURI, STATE OF KENTUCKY, STATE OF TENNESSEE, STATE OF LOUISIANA, STATE OF MISSISSIPPI, and STATE OF ARKANSAS, *Intervening Defendants.*	No. 3, 4 Original.
STATE OF MICHIGAN, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. 3, 5 Original.
STATE OF NEW YORK, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. 3, 6 Original.

SEMI-ANNUAL REPORT OF THE SANITARY DISTRICT OF CHICAGO OF JANUARY 1, 1937, MADE PURSUANT TO DECREE OF APRIL 21, 1930.

F. J. Riley Printing Co. 179 Chicago

IN THE

Supreme Court of the United States

NOS. 5, 8 AND 9, ORIGINAL.

OCTOBER TERM, 1936.

STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and STATE OF PENNSYLVANIA, *Complainants,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, *Defendants,* STATE OF MISSOURI, STATE OF KENTUCKY, STATE OF TENNESSEE, STATE OF LOUISIANA, STATE OF MISSISSIPPI, and STATE OF ARKANSAS, *Intervening Defendants.*	No. 5, Original.
STATE OF MICHIGAN, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. 8, Original.
STATE OF NEW YORK, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. 9, Original.

SEMI-ANNUAL REPORT OF THE SANITARY DISTRICT OF CHICAGO OF JANUARY 1, 1937, MADE PURSUANT TO DECREE OF APRIL 21, 1930.

Pursuant to provisions of paragraph numbered 5 of the Decree in the above entitled causes, entered on April 21, 1930, the Defendant, The Sanitary District of Chicago, hereby makes its semi-annual report of January 1, 1937, as follows:

CONSTRUCTION PROGRAM.

In the semi-annual report of July 1, 1936, the status of completed work in the sewage treatment construction program involved in this case was stated to be on June 1, 1936, as follows:

TABLE 1.

COMPLETED WORK AS OF JUNE 1, 1936.

Calumet Project	$27,543,443.19
North Side Project	37,204,294.38
West Side Project	51,872,242.68
Southwest Side Project	5,548,693.99
West-Southwest Treatment Plant	2,822,264.91
Miscellaneous Plants and Sewers	632,961.20
Chicago River Controlling Works	84,416.37
Total	$125,708,316.72

TABLE 2.

FUTURE WORK AFTER JUNE 1, 1936.

Calumet Project	$ 7,561,000.00
North Side Project	5,027,000.00
West Side Project	1,742,000.00
Southwest Side Project	33,074,000.00
West-Southwest Treatment Plant	23,964,000.00
Miscellaneous Plants and Sewers	1,950,000.00
Chicago River Controlling Works	2,830,000.00
Total	$76,148,000.00

During the six months between the date of the last report and the present report a considerable amount of construction work has been accomplished on the Calumet, the North Side, the West Side and the Southwest Side Sewage Treatment Projects and on the Chicago River Control Works.

Calumet Project. As stated in the last semi-annual report to the Court, the Calumet Sewage Treatment Works, as extended, were placed in operation December 3, 1935 and the Sludge Disposal Plant was placed

in service April 27, 1936. The final contract, for roadways, grading, drainage, lighting, etc., has been 100 per cent completed. The sewage treatment works are therefore complete. Some addition to the capacity of the sludge disposal plant will probably be required within the next three or four years as the sewage load increases, due to the normal population increase.

Construction of sewers in the Calumet region was continued. The South Park Avenue Sewer is now 99 per cent completed; the Colfax Avenue Sewer is now 99 per cent completed; a contract for the construction of the Calumet City Sewer was awarded November 24, 1936 and bids for the comparatively small pumping station to pump this sewage will be received December 30, 1936. Studies are being made for another sewer in this area, designated as the Stony Island Avenue Sewer.

Three other sewers in the Calumet area will still remain to be constructed whenever finances become available. These are the Blue Island Intercepting, the Evergreen Park and the California Avenue-Oak Forest Sewers.

North Side Project. The construction of the Cherry Street, Winnetka, Sewer is now 100 per cent completed. The construction of Additional Final Settling Tanks, etc., for the North Side Treatment Works is now 71 per cent completed. Work yet to be done, for which finances are available consists of certain miscellaneous improvements at the sewage treatment plant, of siphons under the North Shore Channel and of a sewer in Niles. This work is scheduled for 1937. The extension of the North Side Treatment Works and the

construction of certain additional sewers in the North Side area may reasonably be deferred for four or five years, though included in the program submitted to the Court. Experience in operating the treatment plant and a reduction in the detention period of the sewage for aeration indicates that the plant has far greater capacity than was considered possible in 1928.

West Side Project. The main West Side Intercepting Sewer has been completed and placed in service, as was stated in the last semi-annual report to the Court. The sewage treatment plant had previously been in service giving partial treatment to the West Side sewage, by sedimentation and digestion in Imhoff tanks. Construction of three collateral intercepting sewers was started within the past six months. A contract for the construction of the sewer from Harrison to Taylor Street was awarded October 1, 1936 and this construction is now 70 per cent completed. A contract for the construction of the Halsted Street Sewer was awarded October 15, 1936 and construction was started November 28, 1936. A contract for the construction of the Goose Island Sewer was awarded October 22, 1936 and this construction is now 45 per cent completed.

The remaining work in the West Side Project, dependent upon future financing, consists of certain collateral sewers and sewer connections in the area adjacent to the Main Drainage Channel west of Western Avenue and of facilities for the secondary (or complete) treatment of sewage at the West Side Works.

Southwest Side Project. Construction was continued on the following contracts for the Southwest Side Intercepting Sewer, mentioned in the last semi-

annual report to the Court: Contract Section 1, now 98 per cent completed; Contract Section 3, now 100 per cent completed; Contract Section 4, now 99 per cent completed; and Contract Section 5, now 30 per cent completed.

The contract for the construction of Section 6 was awarded December 8, 1936 and for Section 7 October 29, 1936. Three other contracts remain on the Southwest Side Intercepting Sewer, all of which are expected to be under construction within the next six months.

Construction was continued on the following contracts of the Upper Des Plaines Intercepting Sewer: Contract Section 1, now 80 per cent completed; Contract Section 2, now 38 per cent completed; Contract Section 3, now 87 per cent completed; Contract Section 5, now 76 per cent completed and Contract Section 6, now 100 per cent completed. Plans and specifications for the small pumping station and for the connection to the Upper Des Plaines Sewer are now approximately 75 per cent completed.

Construction was continued on the West Towns Outlet Sewer and Contract Section 1 is now 45 per cent completed and Contract Section 2 is now 65 per cent completed. Bids will be taken for the construction of the Outfall Structure for the West Towns Outlet Sewer January 7, 1937. A contract for the construction of the Argo Sewer, from the Southwest Sewage Treatment Works to Natchez Avenue, was awarded September 24, 1936. The construction of the future extension of this sewer to Argo depends upon future financing, yet to be arranged.

West-Southwest Treatment Plant. Construction was continued on the following contracts mentioned in the last semi-annual report to the Court: Aeration Tanks, Operating Galleries, Final Settling Tanks, etc., now 92 per cent completed; Electrical Work in connection with Aeration Tanks, etc., now 30 per cent completed; Architectural Work of the Pumping Station and Blower House, now 96 per cent completed; Electrical Work in the Pumping Station, now 5 per cent completed; and Main Influent and Effluent Conduits, now 78 per cent completed.

The fabrication of the following equipment was continued: Steam Turbine driven Pumping Units, now 96 per cent completed; Steam Turbine driven Blower Units, now 94 per cent completed; Sludge Removal Mechanisms, now 97 per cent completed; Venturi Meters, now 90 per cent completed; Large Valves, now 100 per cent completed; Diffuser Plates, now 49 per cent completed; Meters, Valves and Sluice Gates in connection with Effluent Conduits, now 45 per cent completed; Steam Turbine driven Generator Units, now 68 per cent completed; Transformers, now 93 per cent completed; Condensers; Boiler Feed Water Heaters; Boilers and Settings; and Heat Exchangers.

A contract for the construction of the Pump Discharge Chamber and Plant Outfall was awarded July 9, 1936 and this contract is now 19 per cent completed. Bids will be received for the construction of the Preliminary Settling Tanks December 30, 1936.

At the present time 64 per cent of the 400 MGD West-Southwest Sewage Treatment Plant has been

placed under contract and 40 per cent of the total plant completed.

Control Works Chicago River. The contract for construction of the Lock, Guide Walls, etc., comprising about 75 per cent of the entire Control Works project, was awarded July 9, 1936. This contract is now approximately 19 per cent completed. A contract for Electrical Work in connection with the Lock was awarded November 16, 1936.

Financial. The financial condition of The Sanitary District of Chicago has changed little since the time of the last semi-annual report to the Court. The local tax situation has not improved. The amounts of taxes extended for the Sanitary District for the years 1928 to 1935, inclusive, and the amounts collected up to December 4, 1936, pursuant to these extensions, are as follows:

Year	Total Taxes Extended	Amount Collected	Amount Unpaid	Percentage Unpaid
1928.....	$ 19,448,392.46	$ 17,470,012.66	$ 1,978,379.80	10.17
1929.....	24,466,998.58	20,629,210.95	3,837,787.63	15.69
1930.....	22,453,699.40	17,700,544.45	4,753,154.95	21.17
1931.....	20,517,561.90	15,797,753.06	4,719,808.84	20.00
1932.....	19,281,643.24	13,674,879.88	5,606,763.36	29.08
1933.....	18,037,167.48	12,886,864.51	5,150,302.97	28.55
1934.....	21,163,009.22	14,485,058.32	6,677,950.90	31.56
1935.....	16,068,908.60	7,076,653.97	8,992,254.63	55.96
	$161,437,380.88	$119,720,977.80	$ 41 6,403.08	25.84

The amount, $119,720,977.80, shown in the foregoing table, is the amount of Sanitary District taxes collected by the County Collector. Of this amount $115,705,743.99 has been turned over to the Sanitary District.

The taxes collected since the time of the last report to the Court amount to $9,791,841.20, which is about 6.0 per cent of the taxes levied and due. The bonds of the Sanitary District now outstanding amount to $139,945,890. It is expected that $6,623,500 of bonds will be redeemed January 1, 1937, leaving $133,322,390 outstanding. This is still considerably in excess of the bonding capacity of the Sanitary District, which at present amounts to $119,915,555.

Progress of Work. The total work accomplished by The Sanitary District of Chicago in the construction of sewage treatment works during the period from June 1, 1936 (the date of the summaries for the last report) to December 1, 1936 (the date of the summaries for this report) as measured by construction expenditures was, as follows:

TABLE 3.

Calumet Project	$1,569,834.35
North Side Project	420,889.35
West Side Project	204,112.77
Southwest Side Project	4,897,990.06
West-Southwest Treatment Plant	2,221,674.87
Chicago River Controlling Works	261,262.00
Total	$9,575,763.40

In addition to the amounts shown in Table 3, approximately $1,529,000 had been earned by contractors up to December 1, 1936, on the various items of construction work, but had not been paid, being retained by the Sanitary District as reserved percentage until the final completion of the contracts.

By adding the various items indicated in Table 3 to corresponding items in Table 1, the completed por-

tion of the sewage treatment construction program on December 1, 1936, was as follows:

TABLE 4.

COMPLETED WORK AS OF DECEMBER 1, 1936.

Calumet Project	$ 29,113,277.54
North Side Project	37,625,183.73
West Side Project	52,076,355.45
Southwest Side Project	10,446,684.05
West-Southwest Treatment Plant	5,043,939.78
Miscellaneous Plants and Sewers	632,961.20
Chicago River Controlling Works	345,678.37
Total	$135,284,080.12

The estimated cost of future sewage treatment construction, as of December 1, 1936, is as follows:

TABLE 5.

FUTURE WORK AFTER DECEMBER 1, 1936.

Calumet Project	$ 5,929,000
North Side Project	4,593,000
West Side Project	1,603,000
Southwest Side Project	26,588,000
West-Southwest Treatment Plant	21,899,000
Miscellaneous Plants and Sewers	1,000,000
Chicago River Controlling Works	2,546,000
Total	$64,158,000

Funds remaining unexpended from the amounts obtained under the agreement of September 21, 1935 with the Federal Emergency Administration of Public Works are definitely allocated to projects in this future work, estimated to cost $23,445,000. Approximately $2,500,000 of funds obtained from the PWA are not now definitely allocated, but may be used for some of this future work. This leaves work estimated at $38,213,000 to be financed from other sources.

SEWAGE TREATMENT.

The population of The Sanitary District of Chicago, as of January 1, 1937, is about 4,495,000, according to estimates made from the figures of the 1930 census. The industrial wastes in the Sanitary District are assumed to be equivalent to the sewage of 1,770,000 additional persons. Hence, the total population and industrial wastes equivalent amount to 6,265,000. This figure includes the Corn Products wastes, which would have been equivalent to the sewage of 372,000 persons if no recovery had been accomplished. These wastes have been greatly reduced, as a result of certain experimental work initiated by the Sanitary District.

The 1937 total population, and industrial waste equivalent, as above indicated, are estimated as 6,265,000. Up to date, the Sanitary District has assumed that so-called complete sewage treatment could produce an annual average of 85 per cent purification. Hence, so-called complete treatment for the total January 1, 1937 population and industrial wastes equivalent would equal the 100 per cent treatment of the sewage of 5,325,000, which is 85 per cent of 6,265,000.

The expenditures for sewage treatment have been indicated in Tables 1, 3, and 4. The amounts of actual sewage treatment in operation on June 25, 1935 (as of the time of the last report to the Supreme Court) and at the present time are shown in Tables 6 and 7, following:

TABLE 6.

ACTUAL SEWAGE TREATMENT IN OPERATION AS OF JUNE 25, 1936.

Treatment Works	Population Equivalent	Percentage Treatment	Treatment 100 Per Cent Basis
Calumet	284,000	85	241,000
North Side	1,211,000	85	1,029,000
West Side (Sedimentation)	1,602,000	33⅓	534,000
Miscellaneous (Morton Grove, Glenview, Northbrook)	8,000	85	7,000
Corn Products (Reduction)	401,000		364,000
Total	3,506,000		2,175,000

TABLE 7.

ACTUAL SEWAGE TREATMENT IN OPERATION AS OF DECEMBER 24, 1936.

Treatment Works	Population Equivalent	Percentage Treatment	Treatment 100 Per Cent Basis
Calumet	304,000	85	258,000
North Side	1,218,000	85	1,035,000
West Side (Sedimentation)	1,612,000	33⅓	537,000
Miscellaneous (Morton Grove, Glenview, Northbrook)	8,000	85	7,000
Corn Products (Reduction)	372,000		350,000
Total	3,514,000		2,187,000

The extent of the operation of sewage treatment plants at the present time is equal to the 100 per cent treatment of the sewage of 2,187,000 out of 5,325,000 persons, which would be the present possible 100 per cent treatment if the sewage of the total population and industrial wastes equivalent of 6,265,000 were being treated. This indicates the actual treatment of

approximately 41.1 per cent of the total sewage within the Sanitary District, although considerable additional construction work has been performed during this period, for which no credit will be taken in this percent ge until the works are completed and put in operation.

DIVERSION OF WATER.

The net diversion of water from Lake Michigan, during the calendar year 1935, averaged 6,484 cubic feet per second. The domestic pumpage of the Chicago metropolitan area during this period averaged 1,602 cubic feet per second; the inflow from the Des Plaines River averaged 7 cubic feet per second; and the total flow from the Main Channel at Lockport averaged 8,093 cubic feet per second.

Diversion of water from Lake Michigan by The Sanitary District of Chicago since July 1, 1930, has been made in accordance with a Permit from the Secretary of War, dated June 26, 1930, which authorized the diversion of water as specified in the Decree of the Supreme Court, handed down April 21, 1930. This limited the net diversion to an annual average of not more than 6,500 cubic feet per second up to December 31, 1935, and thereafter limits the net diversion to an annual average of not more than 5,000 cubic feet per second up to December 31, 1938. The average monthly diversion, as made under this Permit from January 1 to December 20, 1936, is indicated in the table following:

Month 1936	Total Flow from Main Channel at Lockport C.F.S.	Inflow from Des Plaines River C.F.S.	Domestic Pumpage Chicago Metropolitan Area C.F.S.	Net Diversion From Lake Michigan C.F.S.
January	6256	0	1593	4663
February ...	6670	73	1798	4799
March	6654	28	1704	4922
April	6826	0	1624	5202
May	7593	0	1661	5932
June	6425	0	1707	4718
July	7002	0	1950	5052
August	7086	0	1860	5226
September ..	7475	282	1753	5440
October	5887	0	1677	4210
November ..	6495	0	1614	4881
Dec. 1 to 20.	4900	0	1620	3280
Average..	6606	32	1713	4861

At the request of the United States District Engineer in Chicago an increase was made in the diversion of water from July 8, 1936 to August 7, 1936 in order to increase navigation depths in the Illinois River. This increase, maintained for thirty days, made the gross flow for this period 5,414 c.f.s. average. It increased navigation depths to some extent, though not to the full extent desired; nor could this limited increase be continued as long as desired, because of the necessity of keeping the annual average diversion within the prescribed limits.

An exceptionally heavy rainfall, amounting to 6.3 inches in one week, occurred in the Chicago area between September 11, 1936 and September 17, 1936. This necessitated an increase in the diversion of water to an average for this one week of 6,983 c.f.s., prac-

tically all of which was composed of storm run-off. The Board of Review of the Public Works Administration, in October, 1936, having reviewed a report covering the details of this flood and its effect on the annual average flow in the canal made the following comment: "While it does not seem to the Board to be appropriate to ask for a modification at this time of the decree of the Supreme Court in the Great Lakes diversion case, this experience may well be one of a number of reasons to be advanced at some future time for an increase in the permissible diversion of Lake Michigan water at Chicago. In view of the conditions created by this storm the Board fears that when the flow is limited to an average of 1,500 s. f., the necessary irregularities, in diversion as shown by the records in [this] report will be of such magnitude as to create serious conditions in Chicago harbor during periods of low flow resulting from these irregularities."

The request from the War Department for an increased flow in July and the exceptionally heavy flood in September made it necessary, in order to bring the annual average diversion for 1936 within the 5,000 c. f. s. limit, to materially reduce the flow in the Main Drainage Canal during the month of December, 1936. The rate of diversion, 3,281 c. f. s., estimated as necessary and maintained during the first part of December was still further curtailed December 18, 1936 and after to 2,680 c. f. s., in compliance with instructions from the United States District Engineer at Chicago, as given in a letter dated December 17, 1936. A formal request has been made for a review of the data on which these

instructions were based, but the time is too limited to make the results of such review available for 1936.

All of which is respectfully submitted,

THE SANITARY DISTRICT OF CHICAGO,

By ROSS A. WOODHULL,
President.

WILLIAM H. TRINKAUS,
Acting Chief Engineer.

ERNST BUEHLER,
Attorney.

Attest:

JAMES J. SULLIVAN,
Clerk.